

**Exponential and Logarithmic Functions****The Principle of Exponential Equality (pg. 626 – 630)**

For any real number  $b$ , where  $b \neq -1, 0$ , or  $1$ ,  $b^x = b^y$  is equivalent to  $x = y$ .  
(Powers of the same base are equal if and only if the exponents are equal.)

Many exponential functions can be rewritten with a common base. This allows us to set the exponents equal to each other.

**Examples:**

a)  $2^{5x} = 32$

b)  $3^{x-7} = 27$

c)  $4^x = 8$

d)  $8^x = 32$

e)  $4^x = 8^{2x+5}$

f)  $9^{3x-4} = 27^{2x+5}$

g)  $3^{x^2-5x} = \frac{1}{81}$